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PROGRESS OF THE USSR FOOD INDUSTRY DURING THE POSTWAR FIVE-YEAR PLAN

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The USSR grain problem was solved during the prewar Five-Year Plans, and the meat and dairy industries were greatly strengthened. Provision of these basic sources of foodstuffs guaranteed a high tempo of development in food-processing production.

Until World War II, a capital investment of 8 billion rubles had been invested in the various branches of the USSR food industry. These funds permitted the creation of new enterprises, supplied with the best equipment, and the large-scale refitting of thousands of old enterprises.

In 1940, the USSR's food-industry enterprises produced goods valued at 13.1 billion rubles, whereas in 1913 the total output value was 2.9 billion rubles. These figures include meat, dairy, and fish production.

Despite the great losses suffered during the war, by 1949, many branches of the food industry were exceeding their plans, and had attained the prewar level of production. In the first 4 years of the postwar Five-Year Plan, the output of sugar increased 4.4 times, animal fats, 2.8 times; vegetable oils, 2.6 times; and fish, 1.7 times.

Restoration of Capacity and Growth of Food Production

Several dozen branches of the food industry are engaged in processing vegetable and meat products. All these branches, administered until 1939 by one People's Commissariat of Food Industry USSR, grew to such an extent that it became necessary to create three separate people's commissariats: food, meat and dairy, and fish industry.

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In this article, we will discuss development problems of the 23 food branches administered by the Ministry of Food Industry USSR, including the following branches: bakery, sugar, fats and oils, margarine, alcohol, canned goods, confectionery, tea, salt, vitamins, liquor and vodka, wine, beer, macaroni, fruits and vegetables, concentrated foods, starch syrups, soft drinks, yeast, tobacco, makhorka, soap, and toilet articles. These branches of industry are closely bound up with the entire national economy.

Products of enterprises of the Ministry of Food Industry USSR represent 45 percent of the entire national retail goods turnover.

There are about 11,500 enterprises in the food industry, employing 1.5 million people.

Since it uses a tremendous quantity of heavy-duty technical and thermotechnical equipment and continuous operation automatic machinery, the food industry presents quite a problem to our national machine-building industry. The country is supplying the food industry with equipment and transportation valued at 700 million rubles annually

During the war, about 3,500 of its enterprises were destroyed and razed by the German invaders. The food industry lost 50 percent of its electric-power installations and 40 percent of all its technical equipment.

The food industry has not only encountered great difficulties in restoring lost production capacity, but also in restoring food raw-materials output, including sugar beets, oil seeds, vegetables, potatoes, fruit, etc.

During the postwar Five-Year Plan, however, because of the tremendous help rendered the food industry by the state in the form of new investments and equipment, the industry has not only reached its prewar level of production, but has considerably exceeded it in several branches of the industry.

The new state investments in the Ministry of Food Industry USSR, together with the approved appropriated funds for 1950, now exceed 8 billion rubles. About 700 more enterprises have been restored and rebuilt in 4 years, and 150 more enterprises will be put into operation under the 1950 plan.

The principal capital operations involved the restoration of enterprises in their prewar locations. This was motivated by the desire to utilize to the utmost the preserved part of the fixed assets, area raw-materials production capacity, existing local skilled personnel, living quarters, etc.

Remarkable results also have been achieved in the realization of Stalin's directives concerning the efficient disposition of new construction throughout the country with the objective of "moving industries closer to the natural sources of raw materials and consumption areas, thus avoiding long, expensive transport of goods." (Stenographic minutes, Eighteenth Congress VKP (b), p 660, Gospolitizdat, 1939) During the war, as a part of the industrial relocation to the east, the food industry built in the east and started production at 10 sugar plants, 26 alcohol plants, 16 creameries, 18 tobacco factories, 12 canned-food plants, 12 bakery enterprises, 12 soap plants, 4 salt plants, and many others.

During the postwar Five-Year Plan, considerable investments were made in construction of industries in constituent republics, including Azerbaydzhan, Georgian, Armenian, Turkmenian, Tadzhik, Uzbek, Kazakh, and Kirgiz SSR, close to existing sources of raw materials. Thanks to the above expansion, the fixed assets of the food industry in these republics, as compared with 1940, have increased within the respective republic ministries of food industry as follows:

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SSR	Increase (%)
Kazakh	244
Kirgiz	235
Armenian	194
Georgian	159
Tadzhik	202
Uzbek	153

In many republics, the gross output of food industries has considerably exceeded the prewar peak, and now amounts to the following in the republic ministries of food industry

SSR	1950 (% of 1940 output)
Kazakh	156.5
Kirgiz	133.8
Tadzhik	125.3
Armenian	132.3
Georgian	125.2

Even more significant is the geographical distribution of production achieved, as revealed by data on food-items output. The increases of output in 1950, compared to 1940, expressed in percent, are as follows

Ministry of Food Industry	Confectionery Products	Macaroni	Cigarettes	Beer
USSR, total	114	130	114	100
SSR				
Kazakh	7 times	272	308	110
Georgian	166.4	163	127.4	144
Kirgiz	147.1	68 times	164	109.8
Tadzhik	220	326	--	112.8
Azerbaydzhan	195.5	152	117.9	120.7
Armenian	230	182	203	309
Uzbek	100.8	108	170	118

The food industry has restored a large number of destroyed enterprises, providing them with such production capacities as are required by local demand, thus eliminating long-distance transport. Through the creation of new oil plants in Central Asia, the oil and fat industry has done away with the long haul of cotton seeds from the central regions to distant processing points. The tobacco, confectionery, soap, and other such industries, long characterized by highly centralized production restricted to a few of the largest industrial areas, have now launched a program to create branch enterprises in remote and peripheral areas.

The salt industry, not able as yet to avoid expensive long-distance transport of salt from the east, has at least reduced these hauls through increasing the production base in the middle east region.

It is quite evident that further progress with the problem faced by our food industry, concerning adequate disposition of producing enterprises in proximity to raw-materials sources and consumption areas, will be made during the second postwar Five-Year Plan.

The growth of production capacity in food enterprises has been accompanied by considerable technical progress in providing them with the most modern continuous-motion equipment and automatic machinery (packaging, shaping, filling,

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bottling, and other machines), the introduction of refrigerating equipment in certain production branches, and a thorough mechanization of labor-consuming operations, including loading and unloading of raw materials and finished products.

Good evidence of the technical progress achieved is the fact that 50 food-industry workers have been awarded Stalin Prize for outstanding inventions and basic improvements in production methods. Besides a number of engineers and scientists, many foremen and Stakhanovite workers among the 50 winners received prizes for devising new technical and organizational processes for the food industry.

The tremendous increase in electric-power-producing installations belonging to the food industry is evidence of its rising technical level and the modern machinery used.

Compared with 1940, electric power consumption has increased 2.5 times, while the extent of electrification per man has reached 163 percent of the 1940 level. During the same period, the number of metal working machine tools employed in the food industry has almost doubled.

During the postwar Five-Year Plan, production of technical equipment in machine-building plants of the food industry has increased 4.5 times. Compared to prewar years, restoration and reconstruction, as well as new construction, have been conducted on a much higher technical level. Hundreds of food enterprises have been so modernized as to be unrecognizable, thanks to the most modern equipment, the great expansion of power plants, the introduction of conveyer-line production, and the mechanization of labor-consuming operations.

Increased production of technical crops providing food enterprises with necessary raw materials, and expanded socialist competition have created all the necessary conditions for realization of the production goals set by the postwar Five-Year Plan.

Enterprises of the Ministry of Food Industry USSR have fulfilled the state plans as follows (in percent):

First 2 years of postwar Five-Year Plan	103.5
1948	106.8
1949	104.0

More than 900 enterprises have fulfilled their Five-Year Plans in the first 4 years of the postwar Five-Year Plan and have surpassed their 1950 quotas.

Achievements in the field of increased food production may be seen from the following table:

Increase in Production of Food Items, 1946 - 1950
(% of 1945 output)

	1946	1947	1948	1949	1950 (Planned)
Granulated sugar	100	211	358	439	516
Lump sugar	184	312	540	887	12.5 times
Confectionery goods	154	185	271	347	424
Vegetable oil	119	150	200	265	302
Margarine	145	320	474	561	676
Soap (40% reduced)	103	133	193	347	415
Canned food	118	146	206	264	337
Grape wine	107	123	106	136	200

	1946	1947	1948	1949	1950 (Planned)
Champagne	161	211	142	386	522
Beer	145	175	177	246	307
Cigarettes	203	297	369	431	460
Tea	77	102	105	127	149
Salt	117	144	175	173	149
Gross Output	113	125	155	175	204

The tremendous increase in commodity production in all branches of the food industry has been accompanied by the rise of technical and industrial indexes. At the same time, the technical and economic norms for machinery utilization were surpassed, consumption of raw materials, fuel, and other materials was lowered, and production costs were reduced even beyond the reduction prescribed by the plan. The labor-productivity index is steadily increasing.

During the first years of the Third Five-Year Plan, the gross output of the USSR food industry increased 44 percent, while during the 4 years of the new Five-Year Plan the increase was 75 percent, which means that the rate of growth in the postwar period has been considerably larger than before the war.

The Soviet food industry, in manufacturing its products, strictly follows recipes worked out on a scientific basis to satisfy the customer's demands. The finished products and raw material are subjected to chemical and bacteriological analyses in enterprise laboratories; in addition, there are also color, taste, and odor inspections.

In the field of increased quality and variety of products, there has been accomplished in our country during the years of postwar Five-Year Plan extensive work on the standardization of recipes and on more strict control of quality of raw materials and semifinished and finished products; on increasing output in retail packaging; and in creating a steady, large assortment of goods.

During the first 4 years of the postwar Five-Year Plan, the production of lump sugar increased 12 times. Compared with 1940, the production of packaged sugar cubes in 1950 will increase 1.5 times. Production of paper-wrapped candy is to be almost doubled in the current year. Production of chocolate candies during the postwar Five-Year Plan will be increased 2.5 times. The manufacture of confectionery goods packed in fancy boxes has been fully restored.

Production of crackers, doughnuts, bagels, rich-dough goods, and patties has also greatly increased. The baking industry has established large-scale production of loaf bread, amounting to 17 percent of all the bread production at present.

Production of top-quality margarine has now reached 72 percent of all margarine-industry production. Retail-size margarine packaging has been widely adopted by this industry. The salt industry has considerably increased production of fine-grain salt and packaged salt. The variety of liquor and vodka products has been improved and sale of these products in bulk has been completely discontinued. Liquor recipes have been perfected, and obligatory aging periods increased. Such high-quality brands of tea as "Bouquet of George" and "Extra" are packed in tin boxes. Aromatic tea is being produced.

Mass production of cigarettes in paper packages of 100 has been discontinued, and production of packages of ten boosted; the package design has been improved, and the manufacture of cigarettes in neat packages has been considerably increased.

Production of high-quality wines has been increased. Compared with prewar years, champagne production has increased 1.5 times and brandy production 20 percent. To insure high quality of wine and brandy, longer aging periods have been introduced.

Sanitary rules in the Soviet food industry have been strictly complied with. The food industry has at its disposal several thousands of laboratories which exercise continual sanitary supervision over food production. Several hundred physicians and over 8,000 public-health-service employees are on the job insuring strict application of sanitary regulations.

Restoration of the Food Industry's Raw-Material Base

The basic and decisive prerequisite for the growth of the food industry is a continued expansion of its raw-material base.

The most important raw materials processed by food enterprises are as follows: sugar beets, oleaginous seeds (sunflower, cotton, flax, castor plant, mustard, rape, and others), potatoes, vegetables, tomatoes, fruit, berries, tobacco, makhorka, grapes, beer barley, and tea.

The objective set by the postwar Five-Year Plan is to restore and surpass by 27 percent the prewar level of USSR agricultural output. In 1949 gross grain production surpassed the prewar level.

In 1950, procurements are exceeding the respective procurements for 1945, as follows:

Product	Increase Factor
Sugar Beets	4.7
Potatoes	2.7
Vegetables	2.7
Tomatoes	3.5
Sunflowers	2.7
Tobacco	2.4
Makhorka	2.9
Fruit	2.0
Berries	2.2
Grapes	2.1

Sugar-beet acreage reached its prewar peak as early as 1948, and has considerably surpassed it at present. Along with the increased yield of sugar beets, the volume of stocks is growing.

During the postwar Five-Year Plan, the sugar industry carried out the restoration of its raw-material sources located in the vicinity of existing sugar plants. For this purpose, the sugar industry is rendering agricultural and organizational assistance to kolkhozes producing sugar beets. It supervises the application of scientific agricultural measures and assigns priority in providing such kolkhozes with agricultural machinery and fertilizers. There are 1,300 agronomists working in sugar plants and sugar-beet sovkhozes.

Very important work is being done by sugar-beet sovkhozes in producing high-quality sugar-beet seeds for continuous supply to kolkhozes and peasant farms. In the past year, the gross output of sugar-beet seeds has doubled compared with 1940.

Sugar plants have organized a network of 1,300 collection stations for delivery, grading, storing, and transporting sugar beets.

Whereas in prewar times 80 percent of all sugar beets were transported to plants in wagons and only 20 percent in trucks, this proportion was reversed in 1949; over 80 percent were delivered by truck and less than 20 percent by wagon. In 1949 out of 215 million centners of sugar beets due for delivery to sugar plants, only 25 million will be delivered by wagon.

Truck columns were supplied by the government in 1949 and the delivery of sugar beets to plants was almost completed in the period September - November 1949. An early delivery is highly important to an early start of full-scale plant operation, as well as to reduction for damages suffered by sugar-beets during protracted storage periods prior to processing.

Highly important also is the increase of oleaginous seed production and the expansion of acreage. According to provisions of the postwar Five-Year Plan, acreage devoted to oleaginous crops is to be expanded over the prewar level.

The fats and oils industry is charged with supplying kolkhozes located in the vicinity of its plants with selected seeds, and with supervising the harvesting of oil-yielding sunflower crops.

The alcohol industry is attempting to use more potatoes in order to reduce grain consumption. They are succeeding in fulfilling the delivery plan set for potato producers, and, through consumer cooperatives, have organized the purchase of potatoes in excess of quotas prescribed by plan.

The advantage of using potatoes instead of grain for alcohol production are evident from the fact that the alcohol output from a hectare of potatoes amounts to 720 liters, while one hectare of barley, rye, or wheat yields only 270-290 liters, and one hectare of oats, 180 liters.

During the postwar Five-Year Plan, the proportion of potatoes in the raw-material base of the alcohol industry has greatly increased. The conversion of potatoes into alcohol has almost doubled, while consumption of grain for alcohol production has been reduced almost to one third.

The raw-material base of the canned-goods industry suffered particularly grave damage during the war. Hothouse enterprises located in the vicinity of canned-food plants lost four-fifths of their window frames. The irrigation network lost its motors and pumps and was put out of operation. However, kolkhoz hot-house enterprises in the vicinity of canned food plants have now been fully restored.

Special sovkhozes devoted to supplying kolkhozes with high-quality seeds and seedlings are at the disposal of the canned-food industry. Through continuous application of selection methods, the sovkhozes and the experimental stations of the Scientific-Research Institute of the Canned-Food Industry are creating new and better types of raw materials for canned-food production. The canned-food plants are providing kolkhozes with glass, frames, motors, pumps, pipes, and lumber.

Great efforts have been made in the field of fruit and berry production to restore existing plantations, to replant orchards, to counteract thinning, and to replace barren trees.

The laborious task of tea cultivation has also required great attention. The output of select tea leaves compared with 1940 has increased 40 percent. Several projects for further development of tea growing in Georgia, Azerbaydzhan, and Krasnodar Kray have been approved by the Soviet government.

The tobacco industry has participated in restoring hothouse and drying enterprises in tobacco-growing areas, mechanizing tobacco planting procedures, and supplying kolkhozes with fertilizers.

The wine industry has accomplished extensive restoration of old, and creation of new, vineyards; it has eliminated thinning, and is now supplying kolkhozes with juicy varieties of grapes.

The beer industry, in search of high-quality beer barley, has created new sources of raw materials close to existing breweries.

The confectionery industry now has its own system of sovkhozes producing such products as almonds, peanuts, sesame, and walnuts.

The gustatory characteristics of finished food products depend mainly on ripening periods, grading preservation, and other qualities of the raw materials. For this reason, the work of such Michurin selection workers as V. S. Pustovoyt, L. A. Zadanov, V. K. Morozov, and others, who developed a species of sunflower yielding in its dried form 42 percent oil as against a previous yield of only 33-34 percent, is of the greatest importance to the food industry. A. L. Mazlumov and S. V. Gudvil have developed a highly productive species of beet with an increased sugar content. Through the application of Michurin methods, S. F. Chernenko and other leaders in Soviet fruit production have succeeded in developing, in central USSR, special types of high-grade apples which give high yields.

Goals of the Major Food-Industry Branches in 1950

Soviet industry has at its disposal powerful, modern, technical equipment. Socialist agriculture is supplying food enterprises with tremendous amounts of raw materials. The rising living standard of our population offers the food industry unlimited possibilities for further development.

The 1950 production plan envisages a considerable increase in food production compared with 1949.

Product	Increase (%)
Granulated sugar	17.6
Confectionery goods	23.8
Vegetable oil	17.6
Margarine	20.6
Canned food	27.5
Champagne	35.0
Beer	24.8
Tea	17.2
Soap	19.5

Considering the volume of output and the degree of production mechanization achieved, the baking industry is the leading branch of the food industry. Its production comprises over 40 percent of the entire output of the Ministry of Food Industry USSR. Because of restoration work and new construction, baking capacity surpassed the prewar level as early as 1948.

In Moscow, Leningrad, and other industrial centers, bakeries have been completely mechanized. The largest European bakery enterprises are in Moscow (bakeries No 6, 10, and 12), having a daily capacity of 450-500 tons of bread; this means that each of these bakeries is able to satisfy the daily bread requirements of one million people. The industry now has, compared with the prewar period, four times as many conveyer ovens, twice as many dough-kneading machines, and four times as many dough-cutting machines.

During the postwar years, the baking industry has been provided with over 1,300 Soviet-made high-capacity conveyer ovens, designed by Stalin Prize Winners N. I. Krasnopevtsev and V. N. Lavrov.

The Soviet machine-building industry has provided bakery plants with the most modern technical equipment, which increased production and improved the quality of the bread. The index of bread output relative to the weight of flour has risen as follows:

	1940	1949
Rye bread made of whole flour	160.4	163.7
Wheat bread made of whole flour	150.7	160.4
Wheat bread made of second-grade flour	142.5	147

In 1950, bakery-industry workers launched a drive for the complete utilization of the enormous inventory of equipment, and for the best adjustment of variety to meet the increased demands of the consumer.

Despite the fact that the total capacity of our bakery industry is now far greater than that in prewar days, the existing bakery-industry enterprises cannot cope with the situation created by the rapid growth of many of our cities, and there is further need to increase baking capacities. The baking industry has therefore assigned special priority this year to construction of bakeries in the Ural region, in Sakhalin Oblast, and other areas.

The most important problem facing the baking industry is the development of machines for use in mechanized bakeries of low capacity. The complete mechanization of bakeries in industrial centers and small towns in the near future has been set as an immediate objective by Mikoyan. In compliance with this directive, more than 400 low-capacity flour-sifting machines of the Pioneer type have been distributed to small baking enterprises during the last-1½ years. The baking industry is also confronted with the problem of further mechanizing laborious loading and unloading operations.

The sugar industry is closely bound to many other branches of the national economy and of great importance in the development of agriculture. More than 23,000 kolkhozes in the sugar-beet areas and 200 sovkhozes are engaged in sugar-beet cultivation. More than 2 million people are working in the sugar-beet fields.

The sugar industry is one of the most important sources of by-products for cattle feeding. The sugar-beet by-products derived from one hectare are sufficient to fatten two oxen and there are more than 1.2 million hectares of sugar-beet fields in the Soviet Union.

As a result of the large capital investments and material and technical development effected during the postwar Five-Year Plan, 198 sugar plants were operating in the 1949 sugar season. Seventeen more sugar plants are scheduled to go into operation in 1950. Altogether, 215 sugar plants will be operating in 1950, i.e., four more plants than in 1940. Whereas in prerevolutionary times there was not a single sugar plant in the eastern regions of our country, 20 plants are now operating in Kirgizia, Kazakhstan, Siberia, Georgia, Armenia, Uzbekistan, and the Far East. As early as 1948, the Soviet Union had taken the lead in world beet-sugar production, producing more than United States' beet and cane sugar combined.

The sugar industry faces a huge job in fulfilling the 1950 plan. Not even the record year 1937 had such a crop as the sugar industry will get out this year. During the past several years, the sugar industry has achieved high production

indexes, exceeding those of prewar years. Relative to the weight of beets, sugar production rose from 12.7 percent in 1940 to 13.5 percent in 1949; fuel consumption decreased from 10.5 percent to 9.5 percent.

During the current Five-Year Plan, the capacity of Soviet sugar industry has increased 1.9 times and has surpassed the prewar level. An inadequate capacity still exists, however, in the Ukrainian regions on the left bank of Dnepr River and in Kursk Oblast, where the raw-material supply is increasing faster than plant capacity.

Several steps have been taken by the sugar industry to counteract its seasonal character and to extend the juice-extraction season. Among these are improved methods of beet storage, beet drying, juice storage, and initial sugar processing by the Fremel' method.

Mechanization of laborious loading and unloading operations in the sugar industry has been widely adopted. A special type of tractor loader (as early as 1949, there were more than 500 of them), designed by Soviet engineers and Stalin Prize Winners V. A. Novikov and N. M. Kichigin, is presently loading sugar beets into freight vans, replacing 15,000 workers previously used for this work.

The beet loader designed by Stalin Prize Winner M. D. Obryvko, fitter at the Elan'-Kolenovka Sugar Plant, and adopted for series production, is able to load a 3-ton truck in 3 minutes, whereas this work was previously performed by two workers in 36 minutes. More than 200 Obryvko loaders will be put in operation this year.

Extensive projects are under way for the technical re-equipment of sugar plants, providing them with modern equipment, continuous-motion automatic machinery, improved heating processes, etc. Projects are also under way to reduce losses, fuel consumption, and limestone consumption, and to release up to 8,000 workers.

Among other food-industry branches, the oil-pressing industry occupies an important place. One of the most urgent food supply problems is to satisfy the country's needs for oils.

Through the large investments put into the oil-pressing industry, extensive projects have been carried out in reequipping old-fashioned pressing plants with the most modern oil-processing machinery. In the normal pressing process there remains in the waste product (oil cakes) 7-7.5 percent oil. Through the application of an extraction process (the chemical decomposition of seeds), this waste-oil percentage is reduced to 1-1.5 percent, i.e., five or six times lower than in hydraulic pressing.

Eight oil-extracting plants are now operating in the Ukraine, Kuban, Central Asia, and Far East with two more to go into operation at the end of this year.

Another project in the field of reequipment of oil plants is the mechanization of laborious pressing processes through the use of a new oil-pressing method employing continuous-operation automatic screw presses.

Modernization effected in oil plants has resulted in the following improvements in production indexes over 1940:

Sunflower-Oil Output (percent of seed weight)	1940	1949
Press Method	25.15	26.36
Extraction Method	27.86	29.72

Oil Waste (percent of seed weight)	1940	1949
Press Method	3.36	2.89
Extraction Method	1.35	1.15

In 1949, with its new equipment, the oil-pressing industry produced 15,000 tons of oil, with no additional consumption of raw materials. In 1950, two thirds of the entire oil-seed output will be processed by continuous operation screw presses and the extraction method.

Margarine production surpassed the prewar level in 1948, and the present output is far beyond that of the prewar period. Production capacity of margarine plants has increased 6 times and has surpassed the prewar level 1 1/2 times.

Along with the growth of vegetable-oil output, the soap-manufacturing industry is prospering, since such oil is the most important ingredient in soap. During the past several years, however, the soap-manufacturing industry has been using considerable quantities of inedible fats (naphtha soap, acidol, synthetic aliphatic acids, etc.). The Soviet government directed the soap-manufacturing industry to bring its 1949 output up to the prewar level.

The jump in soap manufacturing is evident from the following data:

	Output (%)		
	1940	1948	1949
60-70 percent laundry soap	100	22	65
Toilet soap	100	60	100
Total output, reduced 40-percent soap	100	60	101

In 1949 alone, soap output increased 79 percent.

The canned-food industry, which during the war lost up to two-thirds of its capacity and almost half of its equipment, has completed considerable work in restoring its lost capacity, organizing its raw-material base, and launching production of a wide variety of canned goods.

Large enterprises such as the Combine imeni Mikoyan in Stanitsa Krymskaya, Krasnodar Kray, the Kherson Canned-Food Plant imeni Stalin, the Plant imeni 1 May in Tiraspol, the Cherkassk Canned-Food Plant, and many others are now equipped with more modern installations than before the war.

A large number of vacuum concentrators have been introduced in the canned-food industry, permitting an increased concentration of dry ingredients in finished products; a vacuum-canning machine, contributing to the improvement of canning and the elimination of a large number of old-type canning machines, has also been put in use. An extensive project to mechanize such laborious processes as washing of glass containers, loading, unloading, and sorting of raw materials, etc., is currently under way. To reduce consumption of tin plate, production of varnished ferrous tins has been organized.

A most important problem in canned-food production is artificial freezing. A quick-freezing process down to -20 and -30 degrees centigrade insures long preservation of food. Fruits and berries subjected to quick freezing retain their natural freshness, aroma, and even their vitamin content. No less important is the refrigeration of canned juice. During 1946 - 1950, the number of freezers used in the canned-food industry increased six times, while the refrigeration capacity of the industry increased more than five times.

The alcohol industry has increased tremendously the output of alcohol. At present, 75 percent of the alcohol produced is used for industrial purposes. Over 150 branches of the Soviet economy are using alcohol as raw or processing material. During the Fourth Five-Year Plan, the capacity of alcohol plants increased several times. At the same time, vodka consumption per person, compared with 1913, has decreased to less than one third. Compared with 1940, investments in the alcohol industry have doubled. Capacity of the power installation for the industry has increased 1.8 times, and the number of electrified plants 1.9 times.

At present, the alcohol industry is undergoing a modernization process to put it on the continuous or semicontinuous manufacturing basis devised by Stalin Prize Winners A. L. Malchenko, M. P. Chistyakov, and F. I. Gladkiy. The new operating processes increase plant capacity and output of alcohol with no additional consumption of raw materials; they decrease fuel consumption and cut down manpower requirements. Thirty-six percent of the entire capacity of Glavspirit (Main Administration of Alcohol Industry) plants has been converted to continuous and semicontinuous operating methods.

New equipment, perfection of production processes, and elimination of waste resulted in the production of an additional 4.8 million liters of alcohol in 1949, with no additional consumption of raw materials and a saving of 53,000 tons of fuel. In the 1947 - 1949 period, labor productivity increased 1.5 times.

Because of newly adopted processes, the alcohol output per ton of raw material was increased, and consumption of fuel decreased, compared with 1940 as follows:

Alcohol Output per Ton of	1940 (Deciliters)	1949 (Deciliters)
Starch	60.3	62.7
Potatoes	10.2	10.95
Molasses	26.8	28.15
Oats	19.5	20.2
Corn	32.1	34.3

The only product of which the output has not increased in the postwar Five-Year Plan is vodka, the production of which is below 1940. However, mechanization has been introduced even in this production branch. In the period 1947 - 1949, vodka-manufacturing plants were provided with 95 automatic bottle-washing machines, 20 automatic filling machines, 200 filling conveyers, and 30 automatic labeling machines.

The wine industry has been very successful in restoring and improving production of high-quality wines. There are up to 115 brands of high-quality Soviet wine. Special popularity is enjoyed by the Crimean desert wines, an area yielding the world's most famous desert wines.

The wine industry is making wide use of refrigeration processes in various production stages (refrigeration of grapes, must, etc.). Compared with 1940, the number of refrigerators has increased five times, and the refrigerating capacity more than three times. Refrigeration of wines down to -2 degrees centigrade decreases the solubility of potassium bitartrate and other elements, and eliminates the wine's cloudiness. The 1950 planned production indexes for aged wines and brandy are 15-20 percent higher than in 1940.

In 1949, the champagne output surpassed the prewar level, and the 1950 output will be 60 percent over 1940. The wine producers have been directed gradually to increase the output of champagne to 50 million bottles annually, thus doubling the output of champagne in France, the leading country in production of champagne wines.

Another high-quality beverage which, along with wine, is to replace vodka is beer. To increase beer production, considerable efforts have been made during the postwar Five-Year Plan to increase the breweries' production capacity and to restore the cultivation of high-quality barley and hops.

Several large breweries are now under construction including those at Ostankin (partly operating), Kolomna, Voronezh, Gor'kiy, Chelyabinsk, Stalingrad, and Khar'kov; the largest Moscow and Leningrad breweries have been restored to full capacity; and the capacities of the Rostov, Krasnodar, and Kuybyshev breweries have been increased.

Perfection of beer quality is receiving much attention by Soviet brewers. More than 100 new refrigerators have been installed in breweries during the postwar Five-Year Plan. The number of refrigerators and their refrigeration capacity compared with 1940, has increased more than three times. Also completed were extensive projects to provide the breweries with automatic bottle-washing, filling, and capping machines. To improve beer quality in compliance with the new standard, the aging period has been increased.

The development of the confectionery industry is good evidence of the continuous growth of the Soviet living standard and the improvement of living conditions. Confectionery-goods output in Tsarist Russia amounted to 70,000 tons annually. The Soviet confectionery industry produced 719,000 tons of goods in 1940.

In the postwar period, confectionery factories have been provided with the most modern equipment. The installation of vacuum-cooking equipment and caramel-shaping machines has mechanized caramel production. New whipping machines, automatic candy- and pastry-molding and shaping machines, and pressing and cutting chains have insured variety production and achieved a high degree of mechanization. Wrapping machines have proved highly valuable in production; they greatly reduce production-space requirements, cut manpower needs, and increase quality of finished products.

The concentrated-food industry was extensively developed during World War II, when it launched mass production of special types of concentrated food for army needs. After the war, so as to participate in the peacetime reconstruction program, the concentrated-food industry had to undergo a basic reorganization in shifting from military to civilian-goods production.

The concentrated-food industry has been provided with the most modern equipment. Plants have been equipped with high-capacity dryers, automatic pressing machines, automatic shaping machines, wrapping machines, etc. In 1950, production of concentrated-food products in small packages will be increased, and variety will be improved. Concentrated-food products are appearing more frequently on the Soviet market.

The tea industry is a pet project of the Soviet government. Except for a few tea plantations, there was no tea industry in old Russia. Tea was imported, and only packaging was done in the country. The Soviet government has been giving special priority to expansion of tea plantations in Georgia, Azerbaydzhan, and Krasnodar Kray, and construction of tea plants. Dozens of plants for initial processing of green tea leaves have been constructed in the vicinity of tea plantations.

Many of the operations, including transportation of tea leaves from plantations, collection from procurement stations, etc., have been mechanized. Plants are provided with a large number of belt conveyers, roller conveyers, and other equipment. Leaf-curing methods have been considerably improved, and the rolling process has been mechanized. Thanks to new machinery and equipment installed in tea plants, and perfected methods of tea cultivations, tea production is growing

fast and reducing the need of imports. Large funds have been appropriated to the tea industry for realization of new projects in the expansion of national tea production.

During World War II, the vitamin industry did a splendid job in supplying the armed forces and civilian population with vitamins. Creation of this particular branch of the food industry is an extremely complicated task. The technological process of vitamin production depends on food chemistry and the delicate synthesis of organic matter.

Equipment and processing methods applied in multiple-type vitamin production must be very precise and strictly regulated. Equipment used in vitamin production is manufactured of special noncorrosive and enamelled materials. The development of domestic drawings and adoption of production processes for the manufacture of the important synthetic vitamin C (ascorbic acid), vitamin B_1, and many other are major accomplishments of the vitamin industry.

The leading branch of food industry, as far as mechanization is concerned, is the salt industry; 94 percent of all loading and unloading operations are now mechanized. All Volga wharves are provided with conveyer-belt installations for unloading salt barges, salt dredging is done by transporters.

The salt-producing enterprises located on Baskunchak Lake and the Aral Sea have been mechanized, and heavy manual work connected with salt production has been replaced by salt-pumping machines. The capacity of a salt pump is 1,600 tons of salt every 24 hours, or the output of 170 workers. This method, besides making work much easier, permits exploitation of salt layers of twice the former depth.

The salt industry has been provided with excavators; cutting, hauling and loading processes have been mechanized. Loading of salt into freight cars is done by caterpillar excavators. Loading capacity of an excavator is 60 tons per hour, which is equal to the work performed by 50 loaders.

The largest salt mine, the No 3 mine of Artemsol, recently put in operation, has an initial capacity of 600,000 tons annually; it is provided with the most modern equipment and the entire salt-extraction process is completely mechanized. Many salt-producing enterprises completed Five-Year Plan quotas as early as 1948, i.e., in 3 years.

A very important enterprise presently under construction is the vacuum-salt plant in Siberia. There is a great need of this top-quality salt in preserving caviar, butter, and other delicacies. Other important enterprises under construction are the salt mines of the Pavlodar group and those located in East Siberia, which are intended to cut down on long hauls of salt from the Far East.

During the postwar Five-Year Plan, much important work was done in the restoration of the tobacco industry. High-capacity shredding and tamping machines were manufactured and put in operation. High-capacity automatic machines are used for mass production of cigarettes. One such machines is able to manufacture and pack 600,000 cigarettes per shift. Compared with 1940, cigarette production has increased four times. Tobacco plants have been provided with pneumatic and air-conditioning equipment; cigarette-tamping machines have been modernized; manufacture of cigarette boxes is being mechanized.

Increased production is also to be noted in all other branches of the food industry, including manufacture of macaroni, liquid starch, toilet articles, yeast, etc.

This year, the entire USSR food industry is concentrating on increasing profitability, reducing production costs and fuel consumption, and utilizing raw and other materials more efficiently. A general objective is to get strict state policies in effect at all enterprises. The food industry has fulfilled the first half of the production plan.

Compared with the output for the first half of last year, the 1950 semiannual figures show the following increase (in percent): lump sugar 37, confectionery products 29, vegetable oil 7, margarine 24, canned food 36, concentrated food 27, soap 20, grape wine 63, beer 20, cigarettes 16, and tea 15.

The next task for all seasonal food-industry branches is the active participation in approaching the harvest campaign, and procurement and transport of collected raw materials. Another job is putting into operation 350 new enterprises which are now under construction. All food-producing branches are facing important tasks in further technical improvements, mechanization of laborious processes, and loading and unloading operations. Warehouse construction requires serious attention. Lack of warehouse facilities for raw materials and finished products are already difficulties of the new era, brought about by increased production. All food branches are experiencing these difficulties, which is evidence of the rapid production tempo.

Even greater attention should be given to refrigeration problems, whose importance in the food industry Mikoyan puts on the same level as electrification in industry. Compared with 1940, the total refrigeration capacity of the food industry has increased 1.8 times during the 4 years of the postwar Five-Year Plan. This year there will be an additional 40-percent increase over last year. But this is only the beginning of an extensive project to be carried out in all branches, especially in those producing wine, margarine, beer and canned food.

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